

REMARKS

Claims 12-21 and 23-28 are pending. Claims 12 and 17 are in independent form. Claims 1-11 and 22 have been canceled pursuant to their withdrawal from consideration, without disclaimer, and subject to applicant's right to direct claims to the canceled subject matter in a divisional or other application.

In the action mailed November 3, 2006, claims 12 and 16 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. These claims have been amended to address the Examiner's concerns.

Claim 12

Claim 12 was rejected under 35 U.S.C. § 102 over various references. Claim 12 has been amended to recite subject matter that is related to subject matter recited in former claim 14. Claim 14 was not rejected over those references. Accordingly, the rejections of claim 12 under 35 U.S.C. § 102 are believed to be moot.

Instead, former claim 14 was rejected under 35 U.S.C. § 103(a) as obvious over any of U.S. Patent No. 5,300,377 to Keum (hereinafter "Keum"), U.S. Patent No. 6,780,568 to Nistler et al. (hereinafter "Nistler"), or U.S. Patent No. 6,228,745 to Wheeler et al. (hereinafter "Wheeler") in light of U.S. Patent No. 6,534,225 to Flanders (hereinafter "Flanders").

As an obviousness rejection, the rejection of former claim 14 was based on the contention that a mask including first and second continuous sloped phase edges with first and second lateral distances would have been obvious to one of ordinary skill. Applicant respectfully disagrees.

In this regard, every one of Keum, Nistler, Wheeler, and Flanders relates to a mask that includes a single sloped phase edge with a single lateral distance. For example, Keum's FIG. 9i shows a "sidewall phase shift film 16a [that] is formed on both sides of ... [a] first phase shift film 15a" during a single dry etching. See, e.g., Keum, col. 4, line 43-48. Since both sides of film 16a are formed at the same time, during the same etch, it would appear that both sides of film 16a have the same lateral spacing. There is simply no reason to believe that any other lateral spacing exists on Keum's masks.

As for Nistler, FIG. 9 illustrates a cross-sectional view of a photomask in which the slope of the sidewalls 120' has been decreased. See, e.g., Nistler, col. 5, line 45-48. Both sidewalls 120' are etched simultaneously during one or more isotropic wet etch. See, e.g., Nistler, col. 5, line 18-24. Since both sidewalls 120' are etched simultaneously, using an

isotropic etch process, it would appear that both sidewalls 120' have the same lateral spacing. There is simply no reason to believe that any other lateral spacing exists on Nistler's masks.

As for Wheeler, none of Wheeler's masks include even a single continuous sloped phase edge. See, e.g., Wheeler, FIG. 1, mask 50; FIG. 6, mask 22; FIG. 7a, mask 22; FIG. 8a, mask 22a. Instead, with the exception of mask 50 of FIG. 1, every one of Wheeler's masks includes a single, discontinuous step phase edge.

As for Flanders, many of Flanders' masks include a "gradual slope" that is formed opposite to an opaque image region 22. See, e.g., Flanders, FIGS. 2F, 4F; col. 7, line 40-43. Such gradual slopes are formed by any of a number of different processes, including dry etching, ashing, and ion implantation followed by wet etching. See, e.g., Flanders, col. 5, line 30-42.

In each of these cases, it appears that the entirety of Flanders' masks is exposed to the same process conditions, and that all of the gradual slopes on a mask are formed simultaneously. Since all gradual slopes on a mask appear to be formed at the same time, during the same process, it would appear that all gradual slopes have the same lateral spacing.

There is simply no reason to believe that any other lateral spacing exists on Flanders' masks.

Please note that Flanders' FIG. 1D also fails to show different lateral spacings of different continuous sloped phase edges. In this regard, region 16 is a "step region" that "results in a printable defect region." See *Flanders*, col. 1, line 48-49. Region 16 thus does not constitute a continuous sloped phase edges that spans a lateral distance, as claimed.

Thus, none of Keum, Nistler, Wheeler, and Flanders describe or suggest first and second continuous sloped phase edges that span first and second lateral distances, as recited in claim 12. Since Keum, Nistler, Wheeler, and Flanders all share these same deficiencies, the subject matter recited in claim 12 is not obvious in light of Keum, Nistler, Wheeler, and Flanders in any combination.

Accordingly, Applicant requests that the rejections of claim 12, and the claims dependent therefrom, be withdrawn.

Claim 17

Claim 17 was rejected under 35 U.S.C. § 102 over various references. Claim 17 has also been amended to recite subject matter that is related to subject matter recited in former claim 14. Claim 14 was not rejected over those references.

Accordingly, the rejections of claim 17 under 35 U.S.C. § 102 are believed to be moot.

As discussed above, claim 14 was rejected under 35 U.S.C. § 103(a) as obvious over Keum, Nistler, or Wheeler in light of Flanders.

As amended, claim 17 relates to a method that includes exposing a substrate using a phase shift mask that comprises a pattern comprising a plurality of regions having different step heights, a first continuous sloped phase edge between first adjacent regions having different step heights, and a second continuous sloped phase edge between second adjacent regions having different step heights to image the pattern onto a layer of resist material on the substrate. The first continuous sloped phase edge spans a first lateral distance between the first adjacent regions and the second continuous sloped phase edge spans a second lateral distance between the second adjacent regions.

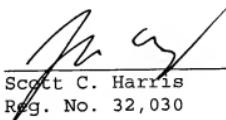
None of Keum, Nistler, Wheeler, and Flanders describe or suggest the exposure of a substrate using such a phase shift mask. In this regard, as discussed above, none of Keum, Nistler, Wheeler, and Flanders describe or suggest first and second continuous sloped phase edges that span first and second lateral distances. Accordingly, exposing a substrate using a mask that comprises a pattern comprising such first and second continuous sloped phase edges is not obvious over Keum, Nistler, Wheeler, and Flanders, in any combination.

Accordingly, Applicant requests that the rejections of claim 17, and the claims dependent therefrom, be withdrawn.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

Applicant asks that all claims be allowed. No fees are believed due at this time. Please apply any charges or credits to Depcsit Account No. 06-1050.

Respectfully submitted,

  
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